STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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June 16, 2004

Dear MTCA Science Advisory Board members:

Re: Review of Guidance on Natural Attenuation under amended MTCA Cleanup Regulation:

- Guidance on Remediation of Petroleum-Contaminated Ground Water By Natural Attenuation
- User's Manual: Natural Attenuation Analysis Tool Package for Petroleum-Contaminated Ground Water
- Workbook: Data Analysis Tool package (hands-on MS Excel Spreadsheet)

Over the past few years, natural attenuation in the remediation of contaminated ground water has drawn tremendous amount of interest from both technical and regulatory perspectives due to the perception of significant cost savings under certain favorable conditions. In response, an enormous amount of technical documents on this subject have been published.

As part of the amendment of the MTCA Cleanup Regulation in February 12, 2001, Ecology set forth expectations regarding when natural attenuation may be appropriate as part of a cleanup action. Those expectations are set forth in WAC 173-340-370(7). During the rule-making process, Ecology committed to providing additional guidance on the appropriate use of natural attenuation as a cleanup action under MTCA and on how to evaluate the feasibility and performance of natural attenuation as a cleanup action for ground water contaminated with petroleum hydrocarbons. As with any other cleanup action alternative, a cleanup action that uses natural attenuation, either alone or in conjunction with other cleanup action components, must achieve cleanup standards within a reasonable restoration time frame and meet the other minimum requirements for cleanup actions set forth in WAC 173-340-360. The guidance clarifies these regulatory requirements and provides the user with the means to determine compliance with those requirements. More specifically, the documents provide guidance regarding the following:

- The advantages and limitations of using natural attenuation;
- The threshold requirements for use of natural attenuation;

- Conducting a remedial investigation, including what data must be collected to adequately characterize the site and evaluate the feasibility of natural attenuation;
- Evaluating the feasibility of natural attenuation, including what criteria must met and what methods can be used to meet those criteria;
- Developing a performance monitoring plan, including what data must be collected to adequately evaluate the performance of natural attenuation;
- Developing a contingency plan, including what site conditions may require conducting additional remedial actions and what contingency remedy may be required;
- Conducting a comparative analysis of feasible cleanup action alternatives;
- Selecting a cleanup action(s); and,
- Implementing the selected cleanup action.

Ecology is requesting the Board's advice on the following technical aspects of the guidance:

(1) The guidance sets forth the following threshold criteria for determining the feasibility of natural attenuation as part of a cleanup action.

- Section 3.5.1: Is natural attenuation currently able to reduce contaminant concentrations?
- Section 3.5.2: Is the reduction of contaminant mass occurring?
- Section 3.5.3: Is natural attenuation able to achieve cleanup standards within a reasonable restoration time frame?
- Section 3.5.4: Does on-site contamination pose an unacceptable threat to receptors during the restoration time frame?
- Section 3.5.5: Is source control conducted to the maximum extent practicable so that natural attenuation, either alone or in conjunction with other cleanup action alternatives, can be determined to be feasible?

These criteria are based on the minimum requirements for cleanup actions set forth in WAC 173-340-360 and the expectations set forth in WAC 173-340-370(7). For each of those criteria, the guidance sets forth recommended methods for evaluating and determining compliance with the criterion. Are those methods within the range of scientific defensibility?

(2) Are there other evaluation methods that are more reflective of current scientific understanding that Ecology should consider when evaluating the feasibility of Natural Attenuation as a cleanup action alternative?

(3) Is the investigative monitoring plan (Section 3.4.2) for evaluating the feasibility of Natural Attenuation within the range of scientific defensibility?

(4) Is the long-term performance monitoring plan (Section 3.6.1) to evaluate the performance of the Natural Attenuation process within the range of scientific defensibility?

Ecology will look forward to introducing the draft guidance at the June 22, 2004 Board meeting. The draft guidance documents and workbooks will be sent to Board members shortly after the June SAB meeting. Should you have any questions on the subject matter, call me at 360-407-7189.

Respectfully,

Hun Seak Park
Toxics Cleanup Program

Enclosures

MTCA Cleanup Regulation: WAC 173-340-370(7)

"The department expects that natural attenuation of hazardous substances may be appropriate at sites where:

(a) **Source control** (including removal and/or treatment of hazardous substances) has been conducted to the maximum extent practicable;
(b) Leaving contaminants on-site during the **restoration time** frame does not pose an unacceptable threat to human health or the environment;
(c) There is evidence that natural **biodegradation** or chemical **degradation** is occurring and will continue to occur at a reasonable rate at the site; and
(d) Appropriate **monitoring requirements** are conducted to ensure that the natural attenuation process is taking place and that human health and the environment are protected."

Core Publications used to develop Natural Attenuation Guidance for Petroleum-Contaminated Ground Water

- USEPA, May 2001, Monitored Natural Attenuation: USEPA Research Program- an EPA Science Advisory Board Review. EPA-SAB-EEC-01-004;
- USEPA, April 1999, Use of monitored Natural Attenuation at superfund, RCRA Corrective Action, and Underground Storage Tank Sites;
- National Research Council, 2000, "Natural Attenuation for Groundwater Remediation", by National Risk Management Research Laboratory Committee on Intrinsic Remediation;
- ASTM E1943-98, 1998, Standard Guide for Remediation of Ground Water by natural Attenuation at Petroleum Release Sites;
- US Air force Center for Environmental Excellence, 1995, "Technical Protocol for Implementing Intrinsic Remediation with Long-term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater; and
- All 50 US states, federal (ITRC, Sandia National Lab, Dept of Energy), industries' policies; most current articles.

Dr. Matthew Small of US EPA R9 had conducted the critical peer-review on "draft Natural Attenuation Guidance."